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## DANGEROUS COMMUNICABLE DISEASES.

HOW SPREAD, HOW RESTRICTED AND PREVENTED.

Data and Statements Supplied to School Superintendents and Teachers by the Michigan State Board of Health, in compliance with Act No. 146, Laws of 1895.\*

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In Michigan the most dangerous communicable diseases, named in the order of their importance as causes of death, are consumption, pneumonia, influenza,† diphtheria, typhoid fever, scarlet fever, measles, whooping-cough, and small-pox.

The relative importance of these diseases is shown by the diagram below. Consumption causes many more deaths than does any other disease.

### DEATHS IN MICHIGAN, 10 YEARS, 1887-96.

CONSUMPTION.

PNEUMONIA.

DIPHTHERIA.

TYPHOID FEVER.

SCARLET FEVER.

MEASLES

WHOOPING-COUGH.

SMALL-POX.

[PLATE 974]

### Principal modes by which the communicable diseases are spread.

Most of the so-called "contagious" diseases are usually spread by means of atmospheric dust of which the germs of these diseases sometimes constitute a part. Consumption, diphtheria, pneumonia, influenza, scarlet fever, measles, whooping-cough, and small-pox are usually spread in this manner. Probably these diseases are not usually caught or contracted except through some break in the skin or in the mucous membrane lining some cavity. Such breaks or ulcerations occur not infrequently in the throat at those seasons of the year when the atmosphere is what is known as "raw;" that is, when it contains the throat irritant ozone, and when it is irritating by reason of its drying effect in cold, windy weather. These diseases are apparently usually contracted by taking in the germs with the breath, through the mouth, and probably sometimes through the nose. The nose is so constructed, and so guarded by minute hairs, kept moist by the exhaled breath and by secretions, that very little dust of any kind is permitted to pass beyond the nose, so long as that organ is in its normal condition; but so much dust-laden air passes through the nose that much dust is there collected. Generally such dust contains many species of bacteria, spores, and germs, some of which are capable of causing a specific disease. For instance, the micro-organisms (pus-cocci), which cause suppuration (the formation of pus), are so generally present that any break in the skin or mucous membrane is usually followed by the formation of pus. The germs of pneumonia are quite generally distributed, so that they are sometimes found present in the noses and mouths of persons not yet suffering from pneumonia.

Because of these facts, handkerchiefs once used, are very liable to spread disease, in case any secretion from the nose has dried on so that it may be detached and form dust that may be taken in with the breath or enter any break in the skin.

\* Section 1 of this act, requires "That there shall be taught in every year in every public school in Michigan the principal modes by which each of the dangerous communicable diseases is spread, and the best methods for the restriction and prevention of each such disease. The State Board of Health shall annually send to the public school superintendents and teachers throughout this State, printed data and statements which shall enable them to comply with this act. School boards are hereby required to direct such superintendents and teachers to give oral and blackboard instruction, using the data and statements supplied by the State Board of Health." (Section 2 provides penalties for non-compliance.)

† Up to the year 1889, influenza caused few deaths in Michigan; but in 1890, 1891, and 1892, the deaths reported from it averaged over 1,000 per year.

## 2 RESTRICTION OF DANGEROUS COMMUNICABLE DISEASES.

*Some of the chief sources of danger of contracting diseases are:*

1. Dust from infected handkerchiefs. (A general rule applicable to all persons, sick and well, is that handkerchiefs should be looked upon with suspicion. They should not be used after any secretion from the nose has been permitted to dry upon them. After being used they should be put into a paper bag which may then have its top twisted shut, there to remain until put into boiling water.)
2. Dust from floors or articles upon which infected sputum or saliva has been ejected.
3. Contact with the hands of persons who cough into their hands, or who handle infected handkerchiefs or cloths into which they have spit.
4. Books, pencils, gum, drinking cups, etc., used in common.
5. Dust from rooms or clothing infected by persons having a communicable disease.
6. Probably typhoid fever may be spread by means of dust containing the germs of that disease; and the germs are believed to be most numerous in the discharges from the bowels and bladder of the person having the disease. This disease is usually spread by drinking-water which has been contaminated with sewage or with leachings from privies. Similar statements are true relative to cholera.

*Dangerous communicable diseases, in the order of their importance, modes by which they are spread, and best methods for their restriction and prevention.*

**Consumption** is now known to be a communicable disease. It is spread by the dust of dried sputa, and also by milk and meat of tuberculous animals. The most important measure for the restriction of consumption is the disinfection or destruction of all sputa of every consumptive person.

It is best that all persons who have a cough should carry small pieces of cloth (each just large enough to properly receive one sputum) and paraffined paper envelopes or wrappers in which the cloth, as soon as once used, may be put and securely enclosed, and, with its envelope, burned on the first opportunity.

**Pneumonia** is spread by a germ which is in the sputum of those who have the disease, (and of some who do not have the disease unless, possibly, after exposure to the inhalation of cold air). Care should always be taken to destroy or disinfect all sputa of those who have pneumonia.

**Influenza** is now believed to be spread by a germ which finds its way from infected handkerchiefs and other articles and places, into the nose, throat, and air passages of persons susceptible to this disease. The measures for its restriction are therefore obvious,—isolation and disinfection.

**Diphtheria** is spread by the sputa, saliva, and whatever comes from the throat and mouth of the patient, and by the dust which results from the drying of such saliva, etc. The germs of diphtheria sometimes remain in the throat weeks after apparent complete recovery. For its restriction and prevention, isolation and disinfection are the important measures,—isolation of every infected person and thing, and their complete disinfection. (See "General Directions," pages 3-4.)

**Typhoid fever.** Unlike typhus fever, typhoid fever is not so often contracted directly from the sick person, but usually from the discharges from the bowels and bladder of the sick person. These should always be properly disinfected. Undisinfected discharges, if dried and formed into dust, may spread the disease through the air. The chief source of danger, however, is believed to be drinking water contaminated by sewage or leachings from privies, etc. The germs permeate the entire body of an infected person,

and are sometimes found some time after apparent recovery. The germs of typhoid fever are not always killed by freezing, but are killed by boiling. All suspected water should be boiled.

**Scarlet fever.** That there is a germ of scarlet fever, seems to be proved by the well known communicability of the disease from person to person. It is spread by the discharges from the nose, mouth, and throat, and probably also by the minute scales which are thrown off from the surfaces of the body. Isolation and disinfection are the measures by which this disease is restricted.

**Measles** is spread from person to person, directly and indirectly. Isolation and disinfection should be enforced.

**Whooping-cough** is a communicable disease which, in Michigan, causes more deaths than does small-pox. Whooping-cough is spread from person to person, directly and probably indirectly. Most of the following "General Directions," except perhaps those for disinfection of the discharges from the kidneys and bowels, are applicable for its restriction.

**Small-pox.** Small-pox is a contagious disease; it spreads by means of particles given off from the surfaces of the body. The following rules are applicable for the *restriction* of small-pox, whenever the disease occurs; but by vaccination and revaccination, small-pox may be and should be, almost wholly *prevented*. One vaccination or once having small-pox does not protect for life. Revaccination should be had once in about five years, also whenever small-pox is prevalent, and certainly immediately after one has been exposed to the disease.

**Cholera** is spread in much the same way as is typhoid fever. The same precautions recommended to prevent the spreading of typhoid fever should be taken as soon as cholera appears, or threatens.

*General directions for the prevention and restriction of scarlet fever, diphtheria, small-pox, and typhus fever.*

1. To avoid the contagium or special cause of the disease:

Isolation and disinfection are the important measures. Unless you are needed to care for the sick or are protected by having recently had the disease, or in case of small-pox, by thorough vaccination, do not go near the sick person. Do not allow your lips to touch any food, cup, or spoon, or anything else that the sick person has touched or that has been in the sick room. Do not wipe your face or hands with any cloth that has been near the sick person. Do not wear any clothing that the sick person has worn, during, just before, or just after his sickness. Keep your hands free from discharges from the body or skin of the sick person. Do not touch him with sore or scratched hands. Avoid inhaling or in any way receiving into the mouth or nose the branny scales that fall or peel from one recovering from, or apparently wholly recovered from scarlet fever; also any dust from the dried saliva of a person sick with or recovering from scarlet fever or diphtheria. The germs of diphtheria sometimes remain in the throat weeks after apparent complete recovery.

2. To restrict the contagium or special cause of the disease:

Isolate the sick. Separate those sick with any of these diseases, even if they are but mildly sick, from all persons except necessary attendants. A person sick with any of these diseases should not be permitted to suffer for want of care, food, or comfort; but all his wants should be attended to by adults or by those who are protected by proper vaccination or by having had the disease. Children and those who are not thus protected, should be kept away from these diseases. Except it be disinfected, no letter or paper should be sent through the mail from an infected place. Do not go from a sick-room to a child or other unprotected person until after change of

#### 4 DATA SUPPLIED BY MICHIGAN STATE BOARD OF HEALTH.

clothing and thorough washing of hands, face, hair, and beard \* Always wash the hands thoroughly after any handling of the sick person or anything that has been in contact with the sick person. Keep those who have been exposed to any of these diseases away from schools, churches, and other assemblies, and from all children, until it is known whether they are infected,—and if they are found to be infected, isolate them until after complete recovery and thorough disinfection.

##### 3. To destroy the contagium or special cause of the disease:

a. Thoroughly disinfect or destroy whatever is removed from the person sick or from the sick-room. All discharges from the lungs, nose, throat and mouth, should be burned or disinfected. All other discharges from the patient should be received into vessels containing a strong solution of chlorinated lime (not less than one ounce to each discharge from the bowels) and then, in cities, thrown into a water-closet connected with a sewer; or where this is impracticable they may be received on old cloths which should immediately be burned or disinfected and buried at least 100 feet distant from any well.

b. Thoroughly disinfect the sick-room and its contents, after removal of the sick person, whether by death or recovery. Disinfect as follows:

Burn whatever has been in contact with the sick person and is not too valuable to burn. Garments, sheets, blankets, etc., such as will not be injured thereby should be boiled for half an hour. After death or recovery of the patient, subject the room and *all its contents* to the vapors of formaldehyde. Before fumigating, hang up and loosely spread out clothing, bedding, etc., or spread them loosely over chairs, leaving the bedstead, other furniture, and every thing in the room. Close all openings to the room very tightly. For a room ten feet square, distil eight ounces of the formaldehyde solution into the room through the keyhole (as illustrated in Teachers' Sanitary Bulletin No. 3) or sprinkle this amount of the solution on an ordinary sheet previously hung up in the room. Another procedure, though less efficacious, is to place three pounds of sulphur in an iron pot or pan, that will not leak, supported on bricks over water in a tub. Set the sulphur afire with live coals or with a spoonful of alcohol lighted by a match. Be careful not to breathe the sulphurous fumes. Leave the room tightly closed for several hours, then air it thoroughly. For a large room use a proportionally larger quantity of sulphur at the rate of three pounds for each 1,000 cubic feet of air space, and burn as much as possible of the sulphur used.

4. Keep your premises and everything connected therewith clean, but remember that *the contagium of these diseases may attach to the cleanest article of clothing, food, drink, book, or paper, if it is exposed thereto.*

5. The law requires householders and physicians to notify the local health officer of the first case and of every case of one of these diseases. The penalty for violation of this law may be as much as one hundred dollars. Plain and distinct notices should be placed on the house or premises in which there is a person sick with one of these diseases.

Unless the local board of health orders otherwise, whoever violates the orders of the health officer is liable to a fine, and to imprisonment if the fine is not paid.

More complete statements of means of restricting and preventing these diseases, are in the pamphlets issued by the State Board of Health, on the "Restriction and Prevention of Scarlet Fever," the "Restriction and Prevention of Diphtheria," the "Restriction and Prevention of Measles," the "Restriction and Prevention of Small-pox," the "Restriction and Prevention of Consumption," and the "Prevention of Typhoid Fever," any of which may be had by addressing the Secretary of the State Board of Health, Lansing, Michigan.

\* Corrosive sublimate, one part to one thousand parts of cologne or water, is sometimes used by physicians for this purpose. This solution should be labeled POISON.